

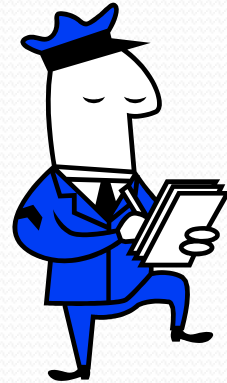
Statistical Thinking For Data Science And Analytics

Preventive and detective
controls and techniques

Dr. Mukaddas Parpidjanova

Internal Controls

- How did this happen?
- When did you know about it?
- Why didn't you prevent it?



Question #1

Internal control is a process designed to provide reasonable assurance regarding the achievement of which objective?

- A. Effectiveness and efficiency of operations
- B. Reliability of financial reporting
- C. Compliance with applicable laws and regulations
- D. All of the above

Internal Controls



What are Internal Controls?

Systems and processes designed to provide management with reasonable but not absolute assurance that the goals and objectives it believes important to the entity will be met.

Internal controls should be a part of **HOW** you do your job, not just “added” to what you already do.

What's the Purpose of Internal Controls?

- Achieve goals
- Carry out management directives
- Reduce surprises
- Increase reliability of information
- Promote efficiency and effectiveness
- Safe guard assets
- Comply with rules and regulations

Question #2

Who is responsible for internal controls?

- A. Upper management
- B. Accountants and Auditors
- C. Supervisors
- D. All employees

Responsibility and Accountability

- Deans, department heads, chairpersons and directors are primarily responsible for **identifying** the financial and compliance risks and internal controls for their operations.
- Individual employees have responsibility for evaluating, establishing and/or improving, and monitoring internal controls for their areas of responsibility and accountability

WHY Are Controls Important?

Management viewpoint

- Transactions are recorded (complete)
- Profitability and reporting accuracy
- Assets are secure and existent
- Compliance with laws and regulations



WHY Are Controls Important?

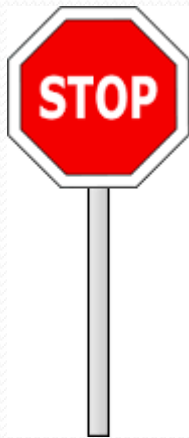
Worker's standpoint

- Reduce errors
- Protection and evidence of no wrongdoing
- Simplify



Controlling Opportunity

Prevent



Control



Monitor



Deter



What do internal controls look like?



Question #3

Control activities can be defined as:

- A. A means to an end
- B. Authorized procedures
- C. The particular category in which a control is placed
- D. The actions of people to help ensure that management directives necessary to address risks are carried out

What can IC protect against?

- **Conflicts of Interest**

Purchasing Schemes / Turnaround Sales

- **Bribery & Incentives**

Kickbacks

- **Billing Schemes**

Shell Companies

Non-Accomplice Vendors / Personal Purchases

- **Expense Reimbursements**

Fictitious Expenses

Multiple Reimbursements

Why Should I Care?

- Protect yourself
- Protect your assets
- Help you do your job
- Help deter fraud
- Management directive





What If We Don't Have Controls

Control deficiency:

The design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect misstatements on a timely basis.

Control Deficiencies Can Result In:

- Break-ins (doors not locked; access from outside not controlled)
- ID theft
- Wrong prisoners released
- Assets misappropriated (stolen)
- Laws broken
- Misstated financial statements
- Inefficiencies resulting in higher costs



Example 1 of Control Deficiencies

- GA Tech professor shaking down students
- <http://www.ajc.com/news/news/breaking-news/georgia-tech-professor-accused-taking-20k-students/nd734/>

Example 2 of Control Deficiencies

- Three employees under investigation by the FBI for suspected fraud of \$1.5 million at Georgia Tech
- <http://www.wsbtv.com/news/news/local/audit-uncovers-suspected-fraud-georgia-tech/nbz5K/>



Evaluating Your Work Environment and Identifying Deficiencies

COSO Model





How does COSO apply to you?

Operations
Financial Reporting
Compliance

Good Internal Controls Help to Ensure:

Effective and Efficient Operations: For example:

- A university has multi-million dollar endowment that is invested in a wide range of traditional and nontraditional investment vehicles to maximize its investment return and spread risk.
- An institution is beginning an aggressive capital campaign and will be assessing its resource requirements (e.g. people, systems) to effectively manage it.
- An institution is implementing a new payroll system and wants to ensure that the implementation will be within budget and that the resulting system will meet its desired business objectives.

In each of these examples, good internal controls give the stakeholders (i.e., benefactors, donors, students, parents, IT users) more faith in the institution's ability to manage its operations effectively and efficiently so it can fulfill its missions of education, research and community service.

Good Internal Controls Help to

Ensure Reliable Financial Reports. For example:

- A state legislator uses a report that has been reconciled to a public university system's annual audited financial statement. The legislator wants to get a sense of how the institution has administered the prior year's appropriations.
- University department heads and chairs monitor financial reports each month that compare their department's budgeted expenses to their actual expenses to assess whether they are on target to meet their budget.
- The National Science Foundation (NSF) reviews financial status report from university to track its use of NSF grants and contracts.

In each of these examples, good internal controls give the users of financial reports (i.e., the legislator, department heads and chairs, and NSF) greater confidence in the reliability of the financial report.

Good Internal Controls Help to

Ensure:

Compliance with Laws and Regulations. For example:

- A college files its Form 990 with the IRS on a timely basis, and the tax return evidences that the institution complies with IRS rules and regulations.
- A university undergoes a self-assessment of its faculty effort reporting policies and controls to ensure it is in compliance with federal research sponsors rules and regulations.
- A regents asks the CBO about compliance with the institution's conflict of interest policy.

In each of these examples, good internal controls give the stakeholders (e.g., IRS, federal sponsors, regents) more confidence that the institution and its employees have complied with laws and regulations.

COSO Model: Environment

- Good control environment
 - Competent people
 - Understand responsibilities
 - Knowledgeable, mindful, committed
 - Policies, procedures, ethics

COSO Model: (Not So Good) Control Environment

Editorial: Albany State financial aid issues

Published: Thursday, October 29th 2015, 8:00 pm EDT

Updated: Thursday, October 29th 2015, 8:06 pm EDT



The Albany State University Financial Aid Office scandal is an embarrassment to the university. It seems university leaders would rather try to ignore it than explain it.

Last week, we finally learned just how bad the fraud and mismanagement in the office has been for years, but we didn't learn that from Albany State.

We had to go to University System of Georgia officials and demand a copy of their investigation into the office that resulted in the

firings of four employees and the suspension of another. It showed a culture of incompetence and malfeasance. Criminal charges are a possibility.

Interim President Art Dunning released a brief written statement about the investigation that did not give any details. Neither he nor anyone else from ASU would do an interview with us about the problems in the office or tell us what has changed, and why students and taxpayers should believe the problems are a thing of the past.

It's unbelievable that problems so serious could go unnoticed or unaddressed for so long. It's equally incredible that ASU leaders don't feel they should give our community the true apology and explanation we deserve.

Copyright 2015 [WALB](#). All rights reserved.

COSO Model: Risk assessment

- Categories
 - Error
 - Omission
 - Delay
 - Fraud
- Balance between the impact of the event or action, and the cost of implementing a control

Question #4

Your department has been struggling to implement the monitoring component of the COSO framework. Which of the following is NOT correct in how the department can implement the monitoring component?

- A. Monitoring can be an ongoing process.
- B. Monitoring can be conducted as a separate evaluation.
- C. An adequate internal audit staff can reduce external audit costs.
- D. The independent auditor can serve as part of the control environment.

COSO Model: Control Activities

1. Preventive controls

- Written policies and procedures
 - Employees know what is expected of them
 - Reference material
 - Training material
 - Consistency & continuity
- Segregation of duties
- Physical control of assets
- Transactions are authorized and approved
- Supporting documentation

COSO Model: Activities

2. Detective

- Inventory counts
- Reconciliations
 - Correct
 - Routine
 - Timely
 - Reviewed by a person outside of the process
- Monitoring that policies are being followed

Types of Controls

Identify as either Preventive or Detective
Give example from your area

- ✓ Approvals and Authorizations
- ✓ Verification
- ✓ Reconciliation
- ✓ Reviews of Performance
- ✓ Security of Assets
- ✓ Segregation of Duties
- ✓ Controls over Information Systems
 - ✓ General (access, passwords)
 - ✓ Application



COSO Model: Communication

- Who does your department communicate to?
- Who provides information to your department?
- Consider:
 - Faculty
 - Students
 - Customers
 - Suppliers
 - Regulators
 - Other departments

COSO Model: Monitoring

- What do you do to make sure that everyone is doing their job well and that all these controls are working properly?
- You can have the best internal controls in place but if you never check to see that the controls are operating right chances are they are NOT.

Consequences of Poor Monitoring

- Loss of reputation/Front page test
- Unable to meet financial obligations
- Sanctions for non-compliance
- Additional rules and regulations



How does COSO apply to you?

Monitoring

Information and Communication

Control Activities

Risk Assessment

Control Environment

COSO Model





Test your Observation

<https://youtu.be/8-hapS2SPz4>

Correcting Control Deficiencies

When business controls contain weaknesses we must choose between the following alternatives:

- Increase supervision and monitoring
- Institute additional or compensating controls and/or
- Accept the inherent risks with the control weakness (assuming management approval)

What If We Don't Have Controls

We open the door for **FRAUD**:



This is the individual who sets the
TONE

Which in turn provides the
OPPORTUNITY
For fraud to occur

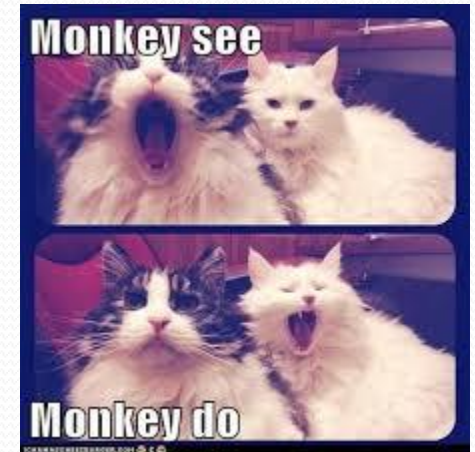


Fraud Triangle:
Opportunity

- The Big Monkey Theory

- Monkey See
- Monkey Do

- Does not matter what's on paper
- It's what the BIG Monkey DOES the Little Monkey will DO!!!



Fraud Triangle: Opportunity

Most pressure comes from a significant financial need or problem

- Family situation
- Medical bills
- Expensive tastes
- Addiction problem
- Greed



Fraud Triangle: Motivation

Rationalization involves a person reconciling his/her fraudulent behavior

- Fraud is justified to save a family member or loved one
- Person believes they will lose everything
- Person believes no help is available
- Job dissatisfaction factors (salaries, work environment, treatment by management) person believes something is owed to him/her
- Person labels the theft as “borrowing”



Fraud Triangle: Rationalization

Typical Fraudster?

- Male
- 36 to 45 years old
- Has not been previously charged or convicted for a fraud-related offense
- Senior management position
- University degree
- Living beyond one's means (financial difficulties)
- Employed by company 1-5 years

What about trust?





Situations That May Contribute to Fraudulent Activities

- Ineffective internal controls
- Insufficient supervision
- High personnel turnover
- Low employee morale



BEST PRACTICES

Value your Signature

- Know what you are signing
- Ask if it is a wise use of taxpayer or student funds?
- You are responsible for what you have signed.
- Don't use a rubber stamp
- Don't include your signature in your email
- Don't sign blank forms
- Don't let other folks sign your name or initials



Protect your Password

- Don't share your password with anybody. **EVER!**
- Don't let anyone watch you enter your password.
- Use a strong password that you don't have to write down.



Protect your Password

Student Admits To Hacking Into University's Computer System To Change Grades

Former Albany State University student Derrick Davis thought he could outsmart his professors by changing his grades. Davis worked part-time in the Information Technology Department while attending University and used his job to obtain access to the school's grading system.

In 2010, Davis changed four of his grades but the boost didn't go unnoticed by his professors. After an investigation was held on the matter, Davis admitted to how he learned his instructor's password and then accessed the school's system to change his grades. He was immediately expelled from the University.

Davis pleaded guilty to computer trespassing in the Dougherty County Superior Court on Monday and was sentenced to two years probation and a \$2,000 fine. Summer school would have been the wiser option compared to the illegal grade change.

[via *Albany Herald*]

Develop Written Procedures

- Resource for current employees
- Training tool for new employees
- Promote consistency and efficiencies
- Manage expectations – everyone knows what is expected of them.

Segregation of Duties

- No one should control any process start to finish.
- No one can approve their own expenditures.
- Each transaction should have at least 2 people involved: an initiator and an approver.
- Reduces the possibility of errors
- Separate persons should approve and record transactions and have custody of the asset
- If not feasible – have compensating controls in place

Financial and Other Reports

- Review budget reports
- Review reports showing who accessed computer files
- P-cards
- Accounts Payable
- Accounts Receivable
- Payroll
- Investigate unusual transactions



PCards

GA Tech

<https://www.youtube.com/watch?v=Buuen1pwJdo>

Cash

- Deposit all cash and checks at the Bursary daily
- Keep cash locked up
- Dual controls
- Accountability: Sign-off each time cash changes hands



Example:

- Cash (contd):
 - What are some controls:
 - Segregate receiving, depositing, recording and reconciling
 - Regular reconciliations
 - Accountability, including sign-offs and receipts
 - Pre-numbered receipts
 - Daily deposits
 - Receipt books

Example:

- Review your cash transactions:
 - What are the risks:
 - Misappropriations
 - Diversion of funds
 - Posting to wrong client account

We've Always Done It That Way

- Review your processes on a continuous basis
- Improve inefficiencies and duplications of effort
- Ask yourself **WHY** you are doing what you're doing and be sure you understand the purpose

Approvals

- Document:
- What?
- Why?



Prevent & Detect Fraud

- Trust your instincts
- Be open to concerns from your staff
- Insist policies and procedures are followed:
 - Prevent fraud
 - Protect employees from accusation of fraud
 - Protect employees from temptation
- Not everything that *looks* suspicious is a fraud, but *every* fraud looks suspicious. If it looks suspicious, follow up on it.

Question #5

- In a university setting what area is *most likely* to have weak internal controls where fraud could occur?
 - A. Accounting
 - B. Operations
 - C. Information Technology
 - D. Human Resources

DO NOT CIRCUMVENT INTERNAL CONTROLS





Accountability

For yourself

For others

For doing the right thing

Where is Your Department?

Internal Control Maturity Model



Reference

- Adventures in Financial Data Science: The empirical properties of financial data and some other things that interested me... Book 1 of 2: Financial Data Science | by Graham Giller | Nov 17, 2020
- Statistical Analysis of Network Data with R (Use R!) Part of: Use R! (70 Books) | by Eric D. Kolaczyk and Gábor Csárdi | Jun 3, 2020
- Statistical Data Analysis Using SAS: Intermediate Statistical Methods (Springer Texts in Statistics) Part of: Springer Texts in Statistics (70 Books) | by Mervyn G. Marasinghe and Kenneth J. Koehler | Apr 23, 2018
- A Common-Sense Guide to Data Structures and Algorithms, Second Edition: Level Up Your Core Programming Skills by Jay Wengrow | Sep 1, 2020
- Statistical Data Analysis (Oxford Science Publications) by Glen Cowan | Jun 4, 1998
- How to do Linguistics with R: Data exploration and statistical analysis by Natalia Levshina | Nov 25, 2015